REMARKS

IN THE CLAIMS

Claims 1, 3 and 4 have been amended herein. Claim 2 has been cancelled. Claims 5 and 6 have been withdrawn from consideration. Support for the amendments can be found in the specification as filed. No new matter has been added.

INFORMATION DISCLOSURE STATEMENT

The relevancy of Japanese Patent Publications 2002-202319 and 2000-072749 will be addressed in a Supplemental Information Disclosure Statement.

CLAIM OBJECTIONS

The objections to claims 1-4 have been rendered moot by the appropriate amendments to the claims. Specifically, claim 1 has been amended to remove the word "type", and the symbol "~" has been replaced with the words "to approximately". Claim 3 has been similarly amended. Claim 4 has been amended to remove the duplicative phrase "fine particles."

§112 REJECTIONS

Examiner has rejected the term "low melting glass powder" in claims 1-3 as not defined. Applicants submit this rejection has been overcome by appropriate amendment to the claims. Specifically, claim 1 has been amended to recite "P_2O_5-SnO low melting glass powder having a softening point of approximately 300°C to 400°C. Support for this amendment can be found in paragraph [0011] of the specification as filed. Applicants submit that this clearly defines the P_2O_5-SnO low melting glass powder of the present invention to one of skill in the art.

Examiner has also rejected the term "low expansion coefficient" in claim 1 as not defined. Examiner alleges that because of this term "one of ordinary skill in the art would not be reasonably appraised of the scope of the invention." However, the specification as filed clearly lists several examples of suitable thermal expansion-controlling ceramics having low expansion coefficients (paragraph [0043]). Thus, Applicants respectfully submit that, contrary to the Examiner's assertion, the term "low expansion coefficient" is clearly defined in the specification such that one of skill in the art will clearly understand the scope of the invention.

Examiner has also rejected the term "insulating" in claims 1-4 as rendering these claims indefinite. Specifically, Examiner alleges it is unclear to one of skill in the art whether the insulating oxide fine particles are electrically, thermally or magnetically insulating. However, the specification clearly states that the insulating oxide fine particles prevent P_2O_5 and SnO from vaporization (paragraph [0034], sections

C and D). Therefore, Applicants respectfully submit that the term "insulating" is clearly defined by the specification such that one of skill in the art will clearly understand the scope of the invention.

§103 REJECTIONS

The Examiner has rejected claims 1-4 as unpatentable over U.S. patent 6,355,586 to Usui et al. (Usui). The Examiner states that Usui teach a glass sealing material comprising a low melting point tin phosphate glass composition, a thermal expansion controlling filler and other insulating oxide fillers. However, the tin phosphate (P_2O_5-SnO) composition taught in Usui also includes at least thirteen other additional oxides. Usui neither teach nor suggest that it would be feasible, let alone successful, to eliminate thirteen of the fifteen oxides present in the Usui composition to render the P_2O_5-SnO composition recited in the present claims. Further, Usui teach away from such a modification, by teaching that several of the additional oxides, specifically ZnO and B_2O_3, are essential (Usui, col. 4, lines 11 and 43). Applicants respectfully suggest that the Examiner is improperly partaking in hindsight reconstruction of the Applicants claims.

The Examiner goes on to state that because Usui teach an average particle size of 10-20μm, it would also be obvious to one of skill in the art to modify this particle size to the approximately 0.001μm to 0.1μm particle size recited in the present claims. However, Usui neither teach nor suggest that a particle size up to *ten thousand times smaller* than the particle size taught by Usui will be successful.

Finally, the Examiner suggests that because Usui also teaches the use of low expansion ceramic fillers, the entire P_2O_5-SnO composition recited in the present claims is obvious. However, as discussed above, Usui do not teach or suggest that the dramatic modifications suggested by the Examiner as obvious will be even feasible as a low melting point glass sealing material, let alone successful.

The Examiner has also rejected claims 1-4 as being unpatentable over U.S. patent 6,048,811 to Morena (Morena). The Examiner states that Morena teaches a glass sealing material comprising a low melting point tin phosphate glass composition, a thermal expansion controlling filler and other insulating oxide fillers. However, like Usui, the glass sealing material taught by Morena requires additional components, specifically ZnO (Morena, Abstract). The Examiner suggests it would be obvious to modify Morena to eliminate the ZnO. However, nothing in Morena teaches or suggests such a modification would be successful. In contrast, Morena teaches away from such a modification, by teaching a composition "consisting essentially of at least 65% SnO-ZnO-P_2O_5" (Morena, Abstract). In fact, Morena refers to its composition throughout the disclosure as the "SnO-ZnO-P_2O_5" composition. Morena neither teaches nor suggests that removing the ZnO would be a plausible modification.

The Examiner goes on to state that, while Morena teaches an average particle size of 10-20μm, it would be obvious to one of skill in the art to modify this disclosed particle size to a particle size up to ten

thousand times smaller. However, nothing in Morena teaches or suggests that such a modification would be feasible, let alone successful. Again, Applicants respectfully suggest that the Examiner is improperly partaking in hindsight reconstruction of the Applicants claims.

However, claim 1 has also been amended to recite insulating oxide fine particles having a particle diameter of approximately 0.001 to approximately 0.1μm, wherein the insulating oxide fine particles are substantially uniformly distributed on the surface of the P_2O_5-SnO low melting glass powder. Neither Usui nor Morena disclose or suggest an insulating oxide having fine particles having a particle diameter of approximately 0.001 to approximately 0.1μm for use in a glass sealing material. As explained in paragraphs [0033] to [0038] of the application as filed, the insulating oxide fine particles of the present claims are uniformly adhered to the surface of the P_2O_5-SnO low melting glass powder.

Further, neither Usui nor Morena disclose or suggest that having fine particles uniformly adhered to the glass powder prevents it from directly contacting the organic vehicle, thereby suppressing devitrification on the surface of the glass powder, as shown in Figs. 3 and 4 of the application as filed. In contrast, Usui discloses the use of SnO, ZnO and P_2O_5 to lower a coefficient of thermal expansion (CTE) of the glass so as to be compatible with the CTE of another glass substrate (Usui, col. 5, lines 18-26). Nothing in Usui discloses or suggests that the insulating oxides may improve the thixotropy of the sealing material paste.

Further still, neither Usui nor Morena disclose or suggest that having fine particles uniformly adhered to the glass powder increases the sealing strength of the glass, as shown in Fig. 7 of the application as filed. Neither Usui nor Morena disclose or suggest that the insulating oxide fine particles represent an essential component of the glass sealing material. In fact, Morena discloses a fusion sealing material consisting essentially of a SnO-ZnO- P_2O_5 glass frit that optionally includes an additive such as lithium, beta-spodumene, cordierite, crystalline pyrophosphates, fused silica, high silica glass and the like that decreases the CTE of the material (Morena, col. 4, lines 22-26). However, nothing in Morena discloses or suggests that insulating oxide fine particles improves the strength and thixotropy of the sealing material.

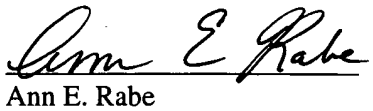
IN CONCLUSION

In short, none of the cited references, either alone or in combination, teach or suggest a P_2O_5-SnO low melting point sealing composition comprising thermal expansion-controlling ceramics having a low expansion coefficient and insulating oxide fine particles.

Accordingly, it is respectfully submitted that claims 1, 3 and 4 are patentable over the cited references. Favorable reconsideration is respectfully requested.

No additional fees for filing this response are believed to be due. However, if such fees are due, the Commissioner is hereby authorized to charge them to deposit account no. 17-0055.

Respectfully submitted,



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